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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/924,054	08/08/2001	Hiroyuki Saito	0050-0094	6171

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EXAMINER	
AHMED, SALMAN	
ART UNIT	PAPER NUMBER
2616	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/21/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

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Office Action Summary	Application No.	Applicant(s)	
	09/924,054	SAITO, HIROYUKI	
	Examiner	Art Unit	
	Salman Ahmed	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 March 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *19-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *19, 21, 22, 24, 25 and 27* is/are rejected.

7)☒ Claim(s) *20,23 and 26* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *8/10/2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claims 19-27 are pending.

Claims 1-18 have been cancelled by the Applicant.

Claims 19, 21, 22, 24, 25 and 27 are rejected.

Claims 20, 23 and 26 are objected to.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 19, 21, 22, 24, 25 and 27 are rejected under 35 U.S.C. 102(e) as being anticipated by Benmohmed et al. (US PAT 6795399, hereinafter Benmohamed).

In regards to claim 19, Benmohamed anticipates a system (Fig 1) for identifying a path for a multiple point communication service (abstract and column 1 line 65-66, apparatus for designing IP networks with substantially improved performance) within a network that includes a plurality of ingress nodes and a plurality of egress nodes and a plurality of links connecting to the ingress nodes and the egress nodes (column 4 lines 26-28, set of nodes corresponding to the points of presence (POPs where routers are located) and E is the set of links which can be used to provide direct connectivity

between the POPs), the system comprising: means for setting an objective function for minimizing a link load in the network (abstract: Methods and apparatus are provided for designing IP networks with substantially improved performance as compared to existing IP networks such as, for example, those networks designed under best-effort criteria. Particularly, the invention includes methods and apparatus for: computing worst-case and optimistic link capacity requirements; optimizing network topology; and determining router placement within a network); means for setting a first constraint expression for deriving the link load (constraint minimum link capacity c,F1FO ref. by col. 7 lines 25-35 and column 13 lines 16-21, depending on the option chosen by the user, the worst-case link capacity requirements are computed. That is, the link capacity for each link in the current network topology is computed based on the demands, the delay, the scheduling/buffering scheme and congestion option selected); means for generating a second constraint expression for selecting a route for data traffic received by the ingress nodes (IP flow demand f; which has a route based on source s and destination t wherein the constraint is the share of link capacity ref. by col. 4 lines 21-48, col. 6 lines 34-55); means for generating a third constraint expression for calculating a link band for the links based on the data traffic received by the ingress nodes (Steps 402-404 of FIG. 4, user-selected congestion scenario and worst-case link capacity requirements Step 402 for generating constraints to compute the bandwidth of Optimistic Link Capacity Step 404 for each link l inclusive of incoming node traffic ref. by col. 13 lines 29-56); means for generating a fourth constraint expression to assure that a link capacity limit associated with the links is not exceeded (limits of upper and lower

bounds of capacities as a function as shown in equations (17)-(20) ref. by col. 12 lines 7-24); and means for identifying a path for the multiple point communication service based on the objective function and the first, second, third, and fourth constraint expressions (column 5 lines 29-30, The results of the final design are output (step 210), e.g., in the form of information displayed to the user of the design system, including: (1) the vector C; (2) the route of each traffic flow f.sub.i ; and (3) the corresponding network cost).

In regards to claim 22, Benmohamed anticipates a method for identifying a path for a multiple point communication service (abstract and column 1 line 65-66, apparatus for designing IP networks with substantially improved performance) within a network that includes a plurality of ingress nodes and a plurality of egress nodes and a plurality of links connecting to the ingress nodes and the egress nodes (column 4 lines 26-28, set of nodes corresponding to the points of presence (POPs where routers are located) and E is the set of links which can be used to provide direct connectivity between the POPs), the system comprising: setting an objective function for minimizing a link load in the network (abstract: Methods and apparatus are provided for designing IP networks with substantially improved performance as compared to existing IP networks such as, for example, those networks designed under best-effort criteria. Particularly, the invention includes methods and apparatus for: computing worst-case and optimistic link capacity requirements; optimizing network topology; and determining router placement within a network); setting a first constraint expression for deriving the link load (constraint minimum link capacity c,F1FO ref. by col. 7 lines 25-35 and column 13 lines

16-21, depending on the option chosen by the user, the worst-case link capacity requirements are computed. That is, the link capacity for each link in the current network topology is computed based on the demands, the delay, the scheduling/buffering scheme and congestion option selected); generating a second constraint expression for selecting a route for data traffic received by the ingress nodes (IP flow demand f; which has a route based on source s and destination t wherein the constraint is the share of link capacity ref. by col. 4 lines 21-48, col. 6 lines 34-55); generating a third constraint expression for calculating a link band for the links based on the data traffic received by the ingress nodes (Steps 402-404 of FIG. 4, user-selected congestion scenario and worst-case link capacity requirements Step 402 for generating constraints to compute the bandwidth of Optimistic Link Capacity Step 404 for each link I inclusive of incoming node traffic ref. by col. 13 lines 29-56); generating a fourth constraint expression to assure that a link capacity limit associated with the links is not exceeded (limits of upper and lower bounds of capacities as a function as shown in equations (17)-(20) ref. by col. 12 lines 7-24); and identifying a path for the multiple point communication service based on the objective function and the first, second, third, and fourth constraint expressions (column 5 lines 29-30, The results of the final design are output (step 210), e.g., in the form of information displayed to the user of the design system, including: (1) the vector C; (2) the route of each traffic flow f.sub.i ; and (3) the corresponding network cost).

In regards to claim 25, Benmohamed anticipates a system (Fig 1) for identifying a path for a multiple point communication service (abstract and column 1 line 65-66,

apparatus for designing IP networks with substantially improved performance) within a network that includes a plurality of ingress nodes and a plurality of egress nodes and a plurality of links connecting to the ingress nodes and the egress nodes (column 4 lines 26-28, set of nodes corresponding to the points of presence (POPs where routers are located) and E is the set of links which can be used to provide direct connectivity between the POPs), the system comprising: an optimization reference generator (figure 1, IP network design system 10) to: set an objective function for minimizing a link load in the network (abstract: Methods and apparatus are provided for designing IP networks with substantially improved performance as compared to existing IP networks such as, for example, those networks designed under best-effort criteria. Particularly, the invention includes methods and apparatus for: computing worst-case and optimistic link capacity requirements; optimizing network topology; and determining router placement within a network), and set a first constraint expression for deriving the link load (constraint minimum link capacity c,F1FO ref. by col. 7 lines 25-35 and column 13 lines 16-21, depending on the option chosen by the user, the worst-case link capacity requirements are computed. That is, the link capacity for each link in the current network topology is computed based on the demands, the delay, the scheduling/buffering scheme and congestion option selected); a route selecting condition generator (figure 1, a network topology optimization processor 18) to generate a second constraint expression for selecting a route for data traffic received by the ingress nodes (IP flow demand f; which has a route based on source s and destination t wherein the constraint is the share of link capacity ref. by col. 4 lines 21-48, col. 6 lines

34-55); a link capacity calculating condition generator (figure 1, worst-case link capacity requirements processor 14) to generate a third constraint expression for calculating a link band for the links based on the data traffic received by the ingress nodes (Steps 402-404 of FIG. 4, user-selected congestion scenario and worst-case link capacity requirements Step 402 for generating constraints to compute the bandwidth of Optimistic Link Capacity Step 404 for each link I inclusive of incoming node traffic ref. by col. 13 lines 29-56); a link including condition generator (Figure 1, optimistic link capacity design processor 16) to generate a fourth constraint expression to assure that a link capacity limit associated with the links is not exceeded (limits of upper and lower bounds of capacities as a function as shown in equations (17)-(20) ref. by col. 12 lines 7-24); and an optimizer (figure 1, a router replacement processor 20) to identify a path for the multiple point communication service based on the objective function and the first, second, third, and fourth constraint expressions (column 5 lines 29-30, The results of the final design are output (step 210), e.g., in the form of information displayed to the user of the design system, including: (1) the vector C; (2) the route of each traffic flow f.sub.i ; and (3) the corresponding network cost).

In regards to claims 21, 24 and 27, Benmohamed anticipates input data rates are associated with the ingress nodes and output data rates are associated with the egress nodes, the multiple point communication service permitting an arbitrary data rate within a range based on the input data rates and the output data rates (column 2 lines 5-20, column 8 lines 51-67, Particularly, upper and lower link capacity bounds are computable to provide the user of the design methodology with worst-case and optimistic results as

a function of various design parameters. That is, given a network topology, specific IP demands and network delays, the design methodology of the invention permits a user to compute link capacity requirements for various network congestion scenarios, e.g., network-wide multiple bottleneck events, for each link of the given network. The difference between r.sub.i.sup.l and the minimum share of demand i at all the other links in its path (which is greater than d.sub.i since r.sub.i.sup.l.gtoreq.d.sub.i at all links in p(i)) can be deducted from c.sub.l.sup.FIFO without violating the demands, otherwise this extra capacity may be captured by other greedy demands traversing link l which already have their requirements met. In this sense, we consider c.sub.l.sup.FIFO in equation (5) as an upper bound on the required link capacity and denote it by c.sub.l.sup.FIFO, where we emphasize the dependence of the weights w.sub.j, and consequently of c.sub.l.sup.FIFO, on the value of H.sub.l. Also, by taking into account the multiple bottleneck effect mentioned above we obtain a lower bound c.sub.l.sup.FIFO on the required link capacity. The value of r.sub.i.gtoreq.d.sub.i could be set to some value that represents any potential limitation due for instance to the speed of the VPN's access link to the network).

Allowable Subject Matter

3. Claims 20, 23 and 26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

4. Applicant's arguments see pages 6-9 of the Remarks section, filed 3/5/2007, with respect to the rejections of the claims have been fully considered and are not persuasive.

Claim 19:

Applicant argues that (page 7, paragraph 2) *Benmohamed et al. does not disclose or suggest means for setting an objective function for minimizing a link load in the network.* However, Examiner respectfully disagrees with the assertion. The claim limitation "objective function for minimizing a link load" is broad, and in view of the broadest reasonable interpretation of the claim language, Benmohamed does indeed teach the cited limitations. Specifically, Benmohamed teaches (abstract) methods and apparatus are provided for designing IP networks with substantially improved performance as compared to existing IP networks such as, for example, those networks designed under best-effort criteria. Particularly, the invention includes methods and apparatus for: computing worst-case and optimistic link capacity requirements; optimizing network topology; and determining router placement within a network). The limitation "objective function for minimizing a link load" is satisfied by substantially improved performance, best-effort criteria, computing worst-case and optimistic link capacity. To further point out, Benmohamed teaches (column 2 lines 6-15 and 30-35) particularly, upper and lower link capacity bounds (objective function for minimizing a link load) are computable to provide the user of the design methodology with worst-case and optimistic results as a function of various design parameters. The design

methodology of the invention permits a user to compute link capacity requirements for various network congestion (objective function for minimizing a link load) scenarios, e.g., network-wide multiple bottleneck events, for each link of the given network. In one embodiment, an iterative augmentation methodology is provided which attempts to reduce network costs by packing small-demands on the spare capacity of some existing links rather than introducing additional poorly utilized links into the network topology. In another embodiment, an iterative deloading methodology (objective function for minimizing a link load) is provided which attempts to reduce network costs by removing identified links which are lightly loaded to form an optimal network topology. As such, Examiner respectfully disagrees with the Applicant's assertion that, *because Benmohamed et al. does not disclose or suggest means for setting an objective function for minimizing a link load in the network, Benmohamed et al. cannot disclose or suggest means for identifying a path for the multiple point communication service based on the objective function and the first, second, third, and fourth constraint expressions, as further recited in claim 19.*

Applicant argues that (page 8, paragraphs 1-4) that, *Benmohamed et al. cannot disclose or suggest means for identifying a path for the multiple point communication service based on the objective function and the first, second, third, and fourth constraint expressions, as further recited in claim 19.* Applicant adds *even assuming, for the sake of argument, that the final design in Benmohamed et al. identifies a path for a multiple point communication service (a point that Applicant does not concede), nowhere in this section, or elsewhere, does Benmohamed et al. disclose or suggest that the final design*

is based on an objective function for minimizing a link load in the network, as would be required by claim 19. However, Examiner respectfully disagrees with the assertion. Benmohamed indeed teaches the cited limitations. As described earlier, Benmohamed teaches means for setting an objective function for minimizing a link load in the network (abstract: Methods and apparatus are provided for designing IP networks with substantially improved performance as compared to existing IP networks such as, for example, those networks designed under best-effort criteria. Particularly, the invention includes methods and apparatus for: computing worst-case and optimistic link capacity requirements; optimizing network topology; and determining router placement within a network); means for setting a first constraint expression for deriving the link load (constraint minimum link capacity c,F1FO ref. by col. 7 lines 25-35 and column 13 lines 16-21, depending on the option chosen by the user, the worst-case link capacity requirements are computed. That is, the link capacity for each link in the current network topology is computed based on the demands, the delay, the scheduling/buffering scheme and congestion option selected); means for generating a second constraint expression for selecting a route for data traffic received by the ingress nodes (IP flow demand f; which has a route based on source s and destination t wherein the constraint is the share of link capacity ref. by col. 4 lines 21-48, col. 6 lines 34-55); means for generating a third constraint expression for calculating a link band for the links based on the data traffic received by the ingress nodes (Steps 402-404 of FIG. 4, user-selected congestion scenario and worst-case link capacity requirements Step 402 for generating constraints to compute the bandwidth of Optimistic Link Capacity

Step 404 for each link I inclusive of incoming node traffic ref. by col. 13 lines 29-56); means for generating a fourth constraint expression to assure that a link capacity limit associated with the links is not exceeded (limits of upper and lower bounds of capacities as a function as shown in equations (17)-(20) ref. by col. 12 lines 7-24). As mentioned above, the limitation "objective function for minimizing a link load" is satisfied by substantially improved performance, best-effort criteria, computing worst-case and optimistic link capacity. To further point out, Benmohamed teaches (column 2 lines 6-15 and 30-35) particularly, upper and lower link capacity bounds (objective function for minimizing a link load) are computable to provide the user of the design methodology with worst-case and optimistic results as a function of various design parameters. The design methodology of the invention permits a user to compute link capacity requirements for various network congestion (objective function for minimizing a link load) scenarios, e.g., network-wide multiple bottleneck events, for each link of the given network. In one embodiment, an iterative augmentation methodology is provided which attempts to reduce network costs by packing small-demands on the spare capacity of some existing links rather than introducing additional poorly utilized links into the network topology. In another embodiment, an iterative deloading methodology (objective function for minimizing a link load) is provided which attempts to reduce network costs by removing identified links which are lightly loaded to form an optimal network topology. Dependent claim 21 is not allowable for the same reasons cited above.

Examiner respectfully disagrees with Applicant's assertion (page 8 last paragraph) that claims 22 and 25 are allowable (page 9 paragraph 2) for the reasons cited above. Dependent claims 24 and 27 are not allowable for the same reasons cited above.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Salman Ahmed whose telephone number is (571) 272-8307. The examiner can normally be reached on 8:00 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on (571) 272-3088. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Salman Ahmed
Examiner
3/18/2007

SA
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